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VARIETY TESTS OF SUGARCANES IN LOUISIANA DURING THE CROP YEAR 1931-32

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INTRODUCTION

The field experiments reported in this circular form part of a continuous series of related tests (*3, 4, 5, 6, 11, 12*) [2] to determine the comparative adaptability to conditions in the Louisiana sugarcane district of the sugarcane varieties grown commercially and promising varieties imported or bred in Florida by the United States Department of Agriculture in cooperation with the Louisiana Agricultural Experiment Station and the American Sugar Cane League. Because of the disastrous consequences of the mosaic epidemic of the decade just past, it is plain that the sugarcane industry cannot afford to be without means of quickly adjusting itself to similar visitations of diseases. The enormous losses caused by mosaic, amounting to over $100,000,000, are attributable to the fact that at the onset of the epidemic and during its initial stages no resistant varieties adapted to local conditions were available. Valuable time was consumed in the search for resistant varieties, and much more time was required to demonstrate to the satisfaction of cane growers that the resistant varieties were reasonably well suited to the environment of the sugarcane belt and to the milling equipment at hand. Therefore, an important general requirement is the development of commercially practicable varieties resistant to mosaic and also to red rot, red stripe, and root diseases. This has been emphasized as an aim of primary importance in the coordinated sugarcane breeding and testing program of the Division of Sugar Plant Investigations of the Bureau of Plant Industry.

An important supplementary requirement, specifically related to the red-rot and root-disease problems, is the selection of varieties

[1] Acknowledgment is made to the Division of Soil Fertility of the Bureau of Chemistry and Soils, and to A. M. O'Neal, of that Division, and S. J. Breaux, Jr., of the Louisiana Agricultural Experiment Station, for their valued cooperation in the phase of the investigation involving a study of the relation between soil type and varietal performance, and in identifying the characteristic soil types of plots of land on which variety tests were carried on.

[2] Italic numbers in parentheses refer to Literature Cited, p. 31.

adapted to the representative soil conditions in the district. Soil variation within this area has long been recognized, but the value of planting particular varieties on the basis of definite adaptation to different soil conditions needs to be brought prominently to the attention of cane growers. In addition to the soil differences between localities there are the more important local variations with reference to elevation and soil structure originating from usual selective processes of sedimentation. The soil areas adjacent to streams, of which Yazoo very fine sandy loam is characteristic, have proved the most productive, chiefly on account of better drainage and better physical condition of the soil. The areas farthest removed from the streams consist chiefly of Sharkey clay or soils of related types, and are usually poorly drained, owing to their slight elevation above water levels of adjacent swamps. Intermediate areas between the two above-mentioned ones, locally referred to as "mixed soil," are usually found satisfactory for sugarcane production where drainage is adequate.[3]

Sugarcane varieties show considerable differences as to their environmental requirements for satisfactory growth, a fact emphatically brought out by the costly mistakes that have resulted from attempts to grow certain varieties on soils to which they were not adapted. As a recent illustration may be mentioned the widespread failure of P.O.J. 213 [4] on Sharkey clay and other poorly drained soils under weather conditions conducive to the development of red rot.

Up to the time of the introduction of the variety C.P. 807 by the United States Department of Agriculture, no variety could be economically grown on Sharkey clay except under very advantageous market conditions; hence sugarcane cultivation was more or less confined to the lighter and better drained soil areas. Because of the promise shown by C.P. 807 under adverse soil and drainage conditions, greater interest has been manifested in the low-lying clay and silty clay areas. In order to satisfy the demand for exact information as to the relative adaptability of the promising varieties to such conditions, tests were conducted during the last 2 years on Sharkey clay or related soils at several localities, in addition to the usual tests on areas of proved agricultural value. The results are considered of vital importance to Louisiana growers, as the evidence shows that suitable varieties are now available for making economic use of all cultivable-soil areas. It should be mentioned, however, that each of the varieties available possesses some undesirable characteristic, such as the crookedness of the stalk of C.P. 807, the poor stubbling qualities of P.O.J. 234, the susceptibility of P.O.J. 213 to attack by the organism causing red rot when grown under unfavorable soil and drainage conditions, and the susceptibility of Co. 281 to injury by mosaic. Unlike C.P. 807, the promising new variety Co. 290 is not immune to mosaic, and possible injury by this disease may limit the usefulness of the variety, but because, in common with some of the P.O.J. varieties grown in Louisiana, it has shown a tendency to recover from mosaic after being infected, it will be formally released for commercial culture in 1933. While this tendency must be taken into account in evaluating a variety, it should be pointed out that it does not take the place of immunity, because observations by pathologists in the

[3] For more detailed descriptions of soil areas and soil types on which sugarcane is grown in Louisiana see O'Neal, A. M., Breaux, S. J., Jr., Schreiner, O., and Hurst, L. A. (*10*).

[4] An explanation of the abbreviations used to designate sugarcane varieties appears as a footnote to table 3.

Division of Sugar Plant Investigations indicate that recurrence of the disease readily takes place in the recovered plants when conditions for spread of the disease are favorable.

SEASONAL CONDITIONS

The winter of 1931–32 was very unusual in that, because of unseasonably high temperatures, sugarcane continued growth during the period of usual winter dormancy. On March 9 subfreezing temperatures were recorded throughout the Louisiana sugarcane district; as a result cane was severely killed back except in a few isolated localities where protection was afforded by adjacent bodies of water. On that date a minimum temperature of 25° F. was recorded at the United States Sugar Plant Field Station at Houma. At the time of the freeze, sugarcane had attained an unusually advanced stage of growth, in most cases the stalks having jointed to a height of from 3 to 10 inches above the ground. Following the freeze some uncertainty was felt as to whether or not the frozen growth would interfere with the development of the new shoots. In some instances it was cut back by means of hand implements or mechanical shavers. Subsequent observations indicated that, generally speaking, better results were obtained where the cane was not cut back. The frozen growth disintegrated rapidly and as a rule did not interfere with new growth or subsequent cultivation. Where the cane had jointed to a height of 15 inches or less, lateral buds were killed practically to the ground and no undesirable aerial shoots subsequently developed. Following the freeze sugarcane grew rapidly and by the first of May had attained a stage of growth considerably more advanced than normal.

TABLE 1.—*Amount and distribution of rainfall at six sugarcane test fields in Louisiana, 1932*

Station	January		February		March		April		May		June		July	
	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches
Albania	9	8.95	5	2.80	6	3.77	3	5.42	6	3.66	6	5.11	10	5.19
Erath	7	11.09	5	2.62	6	3.21	3	4.40	4	8.87	9	10.00	2	2.68
Oaklawn	9	5.75	5	2.80	6	3.90	5	6.85	7	3.30	6	3.25	10	8.70
Raceland	10	5.46	4	2.23	4	3.24	4	7.10	9	8.09	7	3.73	13	11.05
Greenwood	6	5.30	1	2.25	5	3.57	2	3.02	6	5.53	6	4.99	6	6.52
Houma	9	4.75	5	1.85	5	4.47	4	6.90	6	6.37	8	3.79	11	7.26
Normal for Houma	----	3.64	----	4.41	----	3.29	----	4.01	----	3.51	----	5.50	----	8.77

Station	August		September		October		November		December		Total rainfall	
	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches
Albania	8	6.68	5	4.75	2	5.75	6	7.71	14	10.01	80	69.80
Erath	9	6.76	6	10.06	5	9.23	5	4.61	10	6.97	71	80.50
Oaklawn	8	5.75	5	4.55	5	5 60	5	5.45	12	8.70	83	64.60
Raceland	12	9.34	6	9.64	6	10.01	5	2.93	9	6.53	89	79.35
Greenwood	10	9.20	9	5.04	7	7.60	4	3.40	12	6.29	74	62.71
Houma	19	14.22	7	8.98	7	10.73	4	2.80	9	3.81	94	75.93
Normal for Houma	----	6.99	----	5.71	----	3.43	----	2.71	----	4.75	----	56.72

As shown in table 1, rainfall was above normal and was advantageously distributed except in some localities in the western parishes,

particularly at Erath, where a pronounced drought occurred during the latter part of July and early in August. The rainfall was in excess of normal at practically all test stations during September and October.

Abnormally cool weather prevailed during the fall months, which probably accounts for the very satisfactory ripening of sugarcane observed during October and early November. By November 10, sugarcane in all sections of Louisiana had reached an unprecedented stage of maturity. On November 13 a minimum temperature of 27° F. at Houma, and similar temperatures throughout the Louisiana cane district, resulted in considerable bud injury, particularly in exposed localities, which, while not sufficient to cause appreciable deterioration, abruptly checked the ripening process, as indicated by comparative juice analyses. On December 17 a severe freeze occurred throughout southern Louisiana, as indicated by the minimum temperature of 25° recorded at Houma. This resulted in severe injury to sugarcane of all varieties, but harvesting operations were completed before very serious deterioration had taken place. On the whole, therefore, yields of sugar per ton of cane, as shown in this circular, are considerably higher than can be expected under normal conditions in Louisiana. This is particularly true in the case of late-maturing varieties such as Co. 290, which under the conditions reached a stage of maturity not usually realized in Louisiana.

PLOT TECHNIC

Cane yields reported in this circular are based on observed weights obtained from plots of one fortieth of an acre distributed in the usual checkerboard arrangement and replicated from 8 to 12 times. In the plant-cane and first-stubble tests the plot arrangement was in accordance with a modification of the well-known Latin square, which has proved extremely advantageous under Louisiana conditions (*2*). In the latter tests each experiment involved two Latin squares; thus, the number of replications equaled twice the number of varieties in the test, except in the case of first-stubble tests on light soil, where Co. 290 was included in only 1 of the 2 Latin squares, owing to the limited quantity of seed available.

In figure 1 is shown the plot lay-out of a typical variety test, and in table 2 is given an application of the method of statistical analysis employed. The test of significance as based on the observed z value indicates that varietal differences have significantly affected plot weights. From the standard error of the difference as calculated, multiplied by the applicable t values, were determined the values of differences corresponding to the two usual levels of statistical significance, namely, $P=0.05$, and $P=0.01$.[5] In this case it is found that on the basis of $P=0.05$ a difference of ± 3.02 tons per acre may be taken as significant, while on the basis of $P=0.01$ the corresponding difference is 4.18 tons per acre. Thus the odds are 95 to 5 that an observed difference of ± 3.02 tons per acre between the yields of any two varieties would not be due to chance alone, while corresponding odds are 99 to 1 in the case of a difference of ± 4.18 tons per acre. In comparing the average yields of cane obtained with the four varieties in the test given as an illustration (table 12), six differences are

[5] For definition and mathematical derivation of t and z and tabular presentation of their values at different levels of significance (P), see Fisher (*9*).

observed (4.48, 8.58, 12.22, 4.10, 7.74, and 3.64, as given in table 19), five of which may be regarded as definitely significant, and the other corresponding to a probability so close to 0.01 that it might also be regarded as significant. Thus, by measuring the consistency with which observed differences in average results are maintained in the individual plots, statistical analysis affords a basis for determining

SQUARE 1				SQUARE 2			
(C.P. 807) 11.5	(Co. 281) 11.2	(Co. 290) 14.7	(P.O.J. 234) 9.0	(P.O.J. 234) 8.5	(Co. 290) 16.9	(Co. 281) 7.4	(C.P. 807) 12.5
(Co. 281) 10.0	(P.O.J. 234) 9.5	(C.P. 807) 8.6	(Co. 290) 14.3	(Co. 281) 11.4	(P.O.J. 234) 10.1	(C.P. 807) 13.5	(Co. 290) 14.8
(Co. 290) 14.6	(C.P. 807) 14.8	(P.O.J. 234) 8.7	(Co. 281) 10.0	(C.P. 807) 13.1	(Co. 281) 17.1	(Co. 290) 15.0	(P.O.J. 234) 9.2
(P.O.J. 234) 8.1	(Co. 290) 16.7	(Co. 281) 9.5	(C.P. 807) 11.1	(Co. 290) 13.1	(C.P. 807) 17.1	(P.O.J. 234) 8.1	(Co. 281) 9.2

FIGURE 1.—Diagram showing arrangement of plots, each one fortieth of an acre in area, planted to four varieties of sugarcane, and yields (in hundredweight) from the individual plots in the crop year 1931–32.

to what extent any given difference in average results may be attributed to chance. In this connection it should be pointed out, however, that the probability so computed applies only in the particular sense. Under different soil or weather conditions very different results might be obtained.

TABLE 2.—*Analysis of variation in yields shown in figure 1, according to Fisher's method of statistical analysis* [1]

[Values in terms of hundredweight per plot [2]]

Sources of variance	Degrees of freedom	Sum square	Mean square	One half $\log_e$ mean square	z	Mean square of difference	Standard error of difference
Squares	1	6.80					
Rows	6	64.21					
Columns	6	15.71					
Varieties	3	166.65	55.550	2.0086	1.659		
Error	15	30.18	2.012	0.3496		4.024	±0.709
Total	31	283.55					

[1] Fisher (9).

[2] For P=0.05, t=2.131, z=0.5950. For P=0.01, t=2.947, z=0.8448. Values converted to tons per acre (factor=2.0): P.O.J. 234, yield 17.80; C.P. 807, yield 25.54; Co. 281, yield 21.44; Co. 290, yield 30.02. Standard error of difference=±1.418. For P=0.05, D=±3.02; for P=0.01, D=±4.18. (P=probability; D=difference. See discussion in text under Plot Technic.)

SUGAR CALCULATIONS

Sugar yields as reported in previous circulars were based on milling factors obtained as a result of a mill test conducted at the Billeaud, La., factory during 1926. While these factors have proved extremely useful and reliable in connection with sugar calculations with the P.O.J.

canes and other varieties of similar milling properties, there has arisen the need of information with regard to the relative milling qualities of such varieties as C.P. 807 and Co. 290 differing significantly from the P.O.J. varieties in their fiber content, and possibly in other characters affecting their relative milling values. For the last 2 years tests have been conducted with the experimental milling equipment at the Houma field station in an attempt to determine the comparative milling properties of the various varieties now being extensively tested. The results have been given in a separate report *(7)*. On the basis of results obtained with the variety P.O.J. 213, used as control, average reduction factors to convert Houma laboratory-mill juice analyses to juice analyses at 76 percent juice extraction, which is taken as the standard and assumed to be representative of Louisiana milling conditions, were as follows: Brix 0.985, sucrose 0.970. The effect on the indicated yield of sugar per ton of cane of differences in Brix and sucrose-reduction factors and percentage of juice extraction between P.O.J. 213 and each of seven other varieties was determined and converted to a single factor which is designated as the "varietal correction factor." On that basis the following varietal correction factors were developed:

For P.O.J. 36-M, P.O.J. 213, P.O.J. 234, and Co. 281, varietal correction factor=1.00. (No correction.)
For C.P. 807, C.P. 28/11, and C.P. 28/19, varietal correction factor=0.98.
For Co. 290, varietal correction factor=1.06.

As an illustration, let the following laboratory-mill-juice analysis be assumed: Brix 14.00, sucrose 11.00 percent. By applying the above reduction factors the following juice analysis is obtained on the basis of 76 percent juice extraction: Brix 13.79, sucrose 10.67, purity 77.37. Based on the Winter-Carp formula, the yield of available 96° sugar per ton of cane is computed to be 149.2 pounds. The indicated yield so determined would apply directly with the varieties P.O.J. 213, P.O.J. 234, P.O.J. 36-M, and Co. 281. In the case of other varieties, varietal correction factors would be applied as follows:

C.P. 807, C.P. 28/11, C.P. 28/19	149.2×0.98=146.2
Co. 290	149.2×1.06=158.2

Juice analyses given throughout the report are based on the average of samples taken and analyzed in accordance with methods described in previous publications *(3, 4, 5, 6, 11, 12)*.

PLANT-CANE TESTS ON LIGHT SOILS

The results of plant-cane variety tests on the predominating type of light soil found at each of eight representative localities are given in tables 3 to 11, inclusive.

Co. 290 significantly outyielded Co. 281 and each of the P.O.J. varieties in cane per acre and in sugar per acre in all tests, with an indicated yield of sugar per ton of cane on the average higher than the corresponding yield observed with either P.O.J. 36-M or P.O.J. 213. In the average of all tests this variety showed a yield of cane per acre approximately 16 tons in excess of corresponding yields obtained with either of the P.O.J. varieties and outyielded the most productive of them by the impressive difference of 1½ tons of sugar per acre. Its yields of cane per acre were consistently higher than corresponding ones obtained with C.P. 807 in all tests, the differences being signifi-

cant in each of five tests and in the average of all tests. In localities east of the Atchafalaya River (Raceland, Greenwood, and Houma) C.P. 807 gave indicated yields of sugar per ton of cane higher than corresponding ones from Co. 290, while the opposite was true in tests conducted in localities farther west. The indicated yield of sugar per acre was consistently in favor of Co. 290, the average difference being somewhat in excess of 900 pounds and definitely significant.

TABLE 3.—*Results of plant-cane variety tests on Yazoo very fine sandy loam, Godchaux plantation, Raceland, La., 1932*

Variety [1]	Average acre yield of cane [2]	Laboratory-mill juice analyses at harvest, Dec. 15			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons [3]		*Percent*		*Pounds*	*Pounds*	*Tons* [3]
P.O.J. 36-M	18.94	16.31	13.58	83.26	190.2	3,602	10.52
P.O.J. 213	16.30	15.56	13.26	85.22	188.0	3,064	10.64
P.O.J. 234	18.44	17.55	15.48	88.21	223.4	4,119	8.95
C.P. 807	25.45	17.73	15.66	88.32	221.6	5,640	9.03
Co. 281	22.20	18.22	16.19	88.86	234.5	5,206	8.53
Co. 290	30.95	17.31	14.63	84.52	219.0	6,778	9.13

[1] Many varieties of sugarcane are commonly designated by letters or other abbreviations indicating the origin of the seedling cane. The meanings of such designations for the varieties mentioned throughout this circular are as follows: Co.=Coimbatore (India) seedlings; C.P.=Canal Point (Fla.) seedlings; P.O.J.=Proefstation Oost Java seedlings; P.O.J. 36-M=Mingka selection of P.O.J. 36; U.S.=U.S. Department of Agriculture best selections from Canal Point seedlings.
[2] For P=0.05, D=±2.79; for P=0.01, D=±3.77.
[3] Tons of 2,000 pounds are used in tests reported in this circular.

TABLE 4.—*Results of plant-cane variety tests on Yazoo very fine sandy loam, Greenwood plantation, Thibodaux, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Dec. 19			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	19.53	15.70	12.47	79.43	170.2	3,324	11.75
P.O.J. 213	23.35	15.32	12.58	82.11	174.9	4,084	11.44
P.O.J. 234	23.95	16.58	13.90	83.84	195.4	4,680	10.24
C.P. 807	33.70	16.66	14.19	85.17	197.2	6,646	10.14
Co. 281	29.68	17.91	15.29	85.37	217.0	6,441	9.22
Co. 290	41.65	16.13	12.69	78.67	182.6	7,605	10.95

[1] For P=0.05, D=±3.45; for P=0.01, D=±4.65.

TABLE 5.—*Results of plant-cane variety tests on Yazoo very fine sandy loam, United States Sugar Plant Field Station, Houma, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Dec. 21			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	23.55	15.93	13.04	81.86	181.0	4,263	11.05
P.O.J. 213	23.16	15.97	13.69	85.72	194.7	4,509	10.27
P.O.J. 234	23.32	17.13	14.92	87.10	213.9	4,988	9.35
C.P. 807	32.23	16.67	14.27	85.60	198.8	6,407	10.06
Co. 281	27.23	17.80	15.54	87.30	223.1	6,075	8.96
Co. 290	39.14	15.98	12.72	79.60	184.2	7,210	10.86

[1] For P=0.05, D=±2.78; for P=0.01, D=±3.76.

TABLE 6.—*Results of plant-cane variety tests on St. Mary*[1] *silt loam, Midway plantation, Bayou Sale (Foster post office), La., 1932*

Variety	Average acre yield of cane [2]	Laboratory-mill juice analyses at harvest, Dec. 8			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	17.46	16.88	14.58	86.37	208.2	3,635	9.61
P.O.J. 213	18.96	16.80	14.85	88.39	214.5	4,067	9.32
P.O.J. 234	18.42	18.35	16.66	90.79	243.7	4,489	8.21
C.P. 807	30.06	17.42	15.31	87.89	216.1	6,496	9.25
Co. 281	22.26	18.76	16.77	89.39	243.6	5,423	8.21
Co. 290	32.00	17.98	15.33	85.26	230.5	7,376	8.68

[1] Tentative classification.
[2] For P=0.05, D=±2.12; for P=0.01, D=±2.87.

TABLE 7.—*Results of plant-cane variety tests on Pharr silt loam, Oaklawn plantation, Franklin, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Nov. 30			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	22.24	16.03	13.27	82.78	185.3	4,121	10.79
P.O.J. 213	16.74	14.57	11.93	81.88	165.6	2,772	12.08
P.O.J. 234	21.08	16.37	13.88	84.79	196.3	4,138	10.19
C.P. 807	35.58	16.68	14.17	84.95	196.6	6,995	10.17
Co. 281	26.02	17.63	15.15	85.93	215.8	5,615	9.27
Co. 290	38.28	16.92	13.75	81.26	201.5	7,713	9.93

[1] For P=0.05, D=±2.71; for P=0.01, D=±3.66.

TABLE 8.—*Results of plant-cane variety tests on Iberia silt loam, Albania plantation, Jeanerette, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Nov. 21			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	18.20	15.54	12.99	83.59	182.4	3,320	10.96
P.O.J. 213	18.76	15.28	12.96	84.82	183.3	3,439	10.91
P.O.J. 234	20.70	16.66	14.43	86.61	206.3	4,270	9.69
C.P. 807	32.06	16.18	13.93	86.09	194.6	6,239	10.28
Co. 281	24.30	17.44	15.35	88.02	221.2	5,375	9.04
Co. 290	35.60	17.16	14.29	83.27	212.2	7,554	9.42

[1] For P=0.05, D=±3.78; for P=0.01, D=±5.16.

TABLE 9.—*Results of plant-cane variety tests on Vermilion*[1] *silt loam, Caldwell plantation, Erath, La., 1932*

Variety	Average acre yield of cane[2]	Laboratory-mill juice analyses at harvest, Nov. 29			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	17.86	16.30	13.53	83.01	189.2	3,379	10.57
P.O.J. 213	21.24	16.20	13.90	85.80	197.8	4,201	10.11
P.O.J. 234	18.34	17.45	15.32	87.79	220.5	4,044	9.07
Co. 281	20.64	17.63	15.27	86.61	218.3	4,506	9.16
C.P. 807	29.60	15.70	12.99	82.74	177.7	5,260	11.25
Co. 290	35.26	16.34	12.79	78.27	183.5	6,470	10.90

[1] Tentative classification.
[2] For P=0.05, D=±4.07; for P=0.01, D=±5.56.

TABLE 10.—*Results of plant-cane variety tests on Yazoo very fine sandy loam, Alma plantation, Lakeland, La., 1932*

Variety	Average acre yield of cane[1]	Laboratory-mill juice analyses at harvest, Dec. 5			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	16.36	16.18	13.22	81.71	183.3	2,999	10.91
P.O.J. 213	22.44	15.77	13.23	83.89	186.1	4,176	10.75
P.O.J 234	16.48	16.89	14.33	84.84	202.8	3,342	9.86
C.P. 807	32.80	15.28	12.29	80.43	165.6	5,432	12.08
Co. 281	23.44	16.93	14.24	84.11	200.6	4,702	9.97
Co. 290	36.10	15.31	11.65	76.09	164.3	5,931	12.17

[1] For P=0.05, D=±2.55; for P=0.01, D=±3.44.

TABLE 11.—*Differences in average yields observed between sugarcane varieties in plant-cane tests on light soil at different localities in Louisiana*

DIFFERENCES IN YIELDS OF CANE PER ACRE (TONS)

Average yield obtained with—	Minus average yield obtained with—	Raceland (table 3)	Greenwood (table 4)	Houma (table 5)	Oaklawn (table 7)	Albania (table 8)	Bayou Sale (table 6)	Erath (table 9)	Alma (table 10)	Average of 8 tests
Co. 290	P.O.J. 234	+12.51	+17.70	+15.82	+17.20	+14.90	+13.58	+16.92	+19.62	+16.03
	P.O.J. 213	+14.65	+18.30	+15.98	+21.54	+16.84	+13.04	+14.02	+13.66	+16.00
	P.O.J. 36-M	+12.01	+22.12	+15.59	+16.04	+17.40	+14.54	+17.40	+19.74	+16.85
	Co. 281	+8.75	+11.97	+11.91	+12.26	+11.30	+9.74	+14.62	+12.66	+11.65
	C.P. 807	+5.50	+7.95	+6.91	+2.70	+3.54	+1.94	+5.66	+3.30	+4.69
C.P. 807	P.O.J. 234	+7.01	+9.75	+8.91	+14.50	+11.36	+11.64	+11.26	+16.32	+11.34
	P.O.J. 213	+9.15	+10.35	+9.07	+18.84	+13.30	+11.10	+8.36	+10.36	+11.32
	P.O.J. 36-M	+6.51	+14.17	+8.68	+13.34	+13.86	+12.60	+11.74	+16.44	+12.17
	Co. 281	+3.25	+4.02	+5.00	+9.56	+7.76	+7.80	+8.96	+9.36	+6.96
Co. 281	P.O.J. 234	+3.76	+5.73	+3.91	+4.94	+3.60	+3.84	+2.30	+6.96	+4.38
	P.O.J. 213	+5.90	+6.33	+4.07	+9.28	+5.54	+3.30	−.60	+1.00	+4.35
	P.O.J. 36-M	+3.26	+10.15	+3.68	+3.78	+6.10	+4.80	+2.78	+7.08	+5.20
P.O.J. 234	do	−.50	+4.42	−.23	−1.16	+2.50	+.96	+.48	+.12	+.82
P.O.J. 213	do	−2.64	+3.82	−.39	−5.50	+.56	+1.50	+3.38	+6.08	+.85
	P.O.J. 234	−2.14	−.60	−.16	−4.34	−1.94	+.54	+2.90	+5.96	+.03
Difference for P=0.05		±2.79	±3.45	±2.79	±2.71	±3.78	±2.12	±4.07	±2.55	±1.94
Difference for P=0.01		±3.77	±4.65	±3.76	±3.66	±5.16	±2.87	±5.56	±3.44	±2.62

TABLE 11.—*Differences in average yields observed between sugarcane varieties in plant-cane tests on light soil at different localities in Louisiana*—Continued

DIFFERENCES IN INDICATED YIELDS OF 96° SUGAR PER ACRE (POUNDS)

Average yield obtained with—	Minus average yield obtained with—	Raceland (table 3)	Greenwood (table 4)	Houma (table 5)	Oaklawn (table 7)	Albania (table 8)	Bayou Sale (table 6)	Erath (table 9)	Alma (table 10)	Average of 8 tests
Co. 290	C.P. 807	+1,138	+959	+803	+718	+1,315	+880	+1,210	+499	+940
	Co. 281	+1,572	+1,164	+1,135	+2,098	+2,179	+1,953	+1,964	+1,229	+1,662
	P.O.J. 234	+2,659	+2,925	+2,222	+3,575	+3,284	+2,887	+2,426	+2,589	+2,821
	P.O.J. 213	+3,714	+3,521	+2,701	+4,941	+4,115	+3,309	+2,269	+1,755	+3,291
	P.O.J. 36-M	+3,176	+4,281	+2,947	+3,592	+4,234	+3,741	+3,091	+2,932	+3,499
C.P. 807	Co. 281	+434	+205	+332	+1,380	+864	+1,073	+754	+730	+721
	P.O.J. 234	+1,521	+1,966	+1,419	+2,857	+1,969	+2,007	+1,216	+2,090	+1,881
	P.O.J. 213	+2,576	+2,562	+1,898	+4,223	+2,800	+2,429	+1,059	+1,256	+2,350
	P.O.J. 36-M	+2,038	+3,322	+2,144	+2,874	+2,919	+2,861	+1,881	+2,433	+2,559
Co. 281	P.O.J. 234	+1,087	+1,761	+1,087	+1,477	+1,105	+934	+462	+1,360	+1,159
	P.O.J. 213	+2,142	+2,357	+1,566	+2,843	+1,936	+1,356	+305	+526	+1,629
	P.O.J. 36-M	+1,604	+3,117	+1,812	+1,494	+2,055	+1,788	+1,127	+1,703	+1,837
P.O.J. 234	P.O.J. 213	+1,055	+596	+479	+1,366	+831	+422	−157	−834	+470
	P.O.J. 36-M	+517	+1,356	+725	+17	+950	+854	+665	+343	+678
P.O.J. 213	do	−538	+760	+246	−1,349	+119	+432	+822	+1,177	+209
Difference for P=0.05										±480
Difference for P=0.01										±648

DIFFERENCES IN INDICATED YIELDS OF 96° SUGAR PER TON OF CANE (POUNDS)

Average yield obtained with—	Minus average yield obtained with—	Raceland (table 3)	Greenwood (table 4)	Houma (table 5)	Oaklawn (table 7)	Albania (table 8)	Bayou Sale (table 6)	Erath (table 9)	Alma (table 10)	Average of 8 tests
Co. 281	P.O.J. 234	+11.1	+21.6	+9.2	+19.5	+14.9	−0.1	−2.2	−2.2	+9.4
	Co. 290	+15.5	+34.4	+38.9	+14.3	+9.0	+13.1	+34.8	+36.3	+25.4
	C.P. 807	+12.9	+19.8	+24.3	+19.2	+26.6	+27.5	+40.6	+35.0	+26.1
	P.O.J. 213	+46.5	+42.1	+28.4	+50.2	+37.9	+29.1	+20.5	+14.5	+33.1
	P.O.J. 36-M	+44.3	+46.8	+42.1	+30.5	+38.8	+35.4	+29.1	+17.3	+35.6
P.O.J. 234	Co. 290	+4.4	+12.8	+29.7	−5.2	−5.9	+13.2	+37.0	+38.5	+16.0
	C.P. 807	+1.8	−1.8	+15.1	−.3	+11.7	+27.6	+42.8	+37.2	+16.7
	P.O.J. 213	+35.4	+20.5	+19.2	+30.7	+23.0	+29.2	+22.7	+16.7	+23.7
	P.O.J. 36-M	+33.2	+25.2	+32.9	+11.0	+23.9	+35.5	+31.3	+19.5	+26.2
Co. 290	C.P. 807	−2.6	−14.6	−14.6	+4.9	+17.6	+14.4	+5.8	−1.3	+.7
	P.O.J. 213	+31.0	+7.7	−10.5	+35.9	+28.9	+16.0	−14.3	−21.8	+7.7
	P.O.J. 36-M	+28.8	+12.4	+3.2	+16.2	+29.8	+22.3	−5.7	−19.0	+10.2
C.P. 807	P.O.J. 213	+33.6	+22.3	+4.1	+31.0	+11.3	+1.6	−20.1	−20.5	+7.0
	P.O.J. 36-M	+31.4	+27.0	+17.8	+11.3	+12.2	+7.9	−11.5	−17.7	+9.5
P.O.J. 213	do	−2.2	+4.7	+13.7	−19.7	+.9	+6.3	+8.6	+2.8	+2.5
Difference for P=0.05										±10.1
Difference for P=0.01										±13.6

C.P. 807 showed yields of cane per acre in all tests significantly higher than the corresponding ones from Co. 281 or from either of the P.O.J. varieties, its average yield exceeding the average yield from these varieties by 7 to 12 tons, and its indicated yield of sugar per ton of cane was also higher than that of either P.O.J. 213 or P.O.J. 36-M in 6 out of the 8 tests and in the average of all tests. It consistently outyielded P.O.J. 213 and P.O.J. 36-M in yield of sugar per acre in all tests, the average yield amounting to more than 2,300 pounds in excess of the yield from the former and more than 2,500 pounds in excess of the yield from the latter. Its indicated yields of sugar per ton of cane approximated those of P.O.J. 234 in 3 tests out of 8, but were lower in all others and in the average of the 8 tests. Its indicated yields of sugar per acre were consistently higher than those of P.O.J. 234, with an average difference of nearly 1,900 pounds. In every instance its indicated yield of sugar per ton of cane was lower but its indicated yield of sugar per acre higher than corresponding yields of Co. 281.

Yields of cane per acre obtained with Co. 281, while consistently lower than those from C.P. 807 and Co. 290, were either approximately equal to or higher than corresponding ones obtained with either P.O.J. 36-M, P.O.J. 213, or P.O.J. 234, the observed differences being definitely significant in the case of 19 out of the 24 comparisons involved. Its indicated yield of sugar per ton of cane was in all cases higher than corresponding yields from either P.O.J. 36-M, P.O.J. 213, C.P. 807, or Co. 290, with an average difference in each case in excess of 25 pounds. It consistently outyielded P.O.J. 36-M and P.O.J. 213 in yields of sugar per acre, the average increase being in excess of 1,800 and 1,600 pounds, respectively, but consistently yielded less sugar per acre than either C.P. 807 or Co. 290, averaging 721 pounds less than the former and 1,662 pounds less than the latter. It showed indicated yields of sugar per ton of cane higher than corresponding ones from P.O.J. 234 in 5 out of 8 tests, with an average difference of over 9 pounds in favor of Co. 281.

Observed differences in yield of cane per acre between P.O.J. 213, P.O.J. 36-M, and P.O.J. 234 are, on the whole, unimportant. Eighteen out of the twenty-four individual test differences, as well as the three average differences, are definitely within the range of experimental error. P.O.J. 234 maintained consistent leads over P.O.J. 213 and P.O.J. 36-M in point of indicated yield of sugar per ton of cane, with an average difference approaching 25 pounds in each case, and outyielded these varieties in sugar per acre by an average of 470 and 678 pounds, respectively. Observed differences in indicated yields of sugar per ton of cane between P.O.J. 213 and P.O.J. 36-M are without significance except in the case of the Houma test, where the indicated yield of P.O.J. 213 was definitely higher, and in the case of the Oaklawn test, where the indicated yield of P.O.J. 36-M was definitely higher. In the average of all tests the slight difference in favor of P.O.J. 213 is too small to be considered significant.

PLANT-CANE TESTS ON HEAVY SOILS

The results of plant-cane variety tests conducted on Sharkey clay and related soils are given in tables 12 to 19, inclusive.

Yields of cane per acre obtained with Co. 290 were significantly higher than corresponding yields obtained with C.P. 807 at Raceland, Houma, and Alma, and not significantly different at Greenwood and Oaklawn. Differences in yields of sugar per ton of cane between these two varieties were not consistent, and the slight average difference of 2 pounds in favor of C.P. 807 cannot be regarded as significant. The average difference in indicated yield of sugar per acre was somewhat in favor of Co. 290.

Yields of cane per acre obtained with P.O.J. 234 and Co. 281 in all cases were definitely lower than corresponding yields of either Co. 290 or C.P. 807. The usual high indicated yields of sugar per ton of cane were observed with P.O.J. 234 and Co. 281, but are not considered sufficient to compensate for the lower yields of cane per acre. Co. 290 and C.P. 807 consistently outyielded Co. 281 and P.O.J. 234 in pounds of sugar per acre in all tests, Co. 290 outyielding these varieties by an average of 816 and 1,411 pounds, respectively, and

C.P. 807 outyielding them by 717 and 1,098 pounds, respectively. Yields of cane per acre obtained with Co. 281 were higher than corresponding yields of P.O.J. 234 5 times out of 6, and in 3 instances the differences were definitely significant. Indicated yields of sugar per ton of cane from P.O.J. 234 were, on an average, slightly higher than comparative ones of Co. 281, but in all but one test (Albania, table 16) Co. 281 gave higher yields of sugar per acre, the average for all tests amounting to 381 pounds.

TABLE 12.—*Results of plant-cane variety tests on Sharkey clay, Godchaux plantation, Raceland, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Dec. 15			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 234	17.80	15.67	13.13	83.79	184.6	3,286	10.83
C.P. 807	25.54	16.00	13.45	84.06	185.6	4,740	10.78
Co. 281	21.44	16.51	14.08	85.28	199.7	4,282	10.01
Co. 290	30.02	15.63	12.20	78.05	174.7	5,244	11.45

[1] For P=0.05, D=±3.02; for P=0.01, D=±4.18. (See table 2 for analysis of variance of yields in terms of hundredweight per plot.)

TABLE 13.—*Results of plant-cane variety tests on Sharkey clay, Greenwood plantation, Thibodaux, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Dec. 20			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 234	19.46	16.61	14.22	85.61	202.1	3,933	9.90
C.P. 807	28.08	15.63	13.09	83.75	180.3	5,063	11.09
Co. 281	22.10	16.71	14.16	84.74	200.2	4,424	9.99
Co. 290	27.60	15.76	12.74	80.84	186.2	5,139	10.74

[1] For P=0.05, D=±5.22; for P=0.01, D=±7.21.

TABLE 14.—*Results of plant-cane variety tests on Sharkey silty clay, United States Sugar Plant Field Station, Houma, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Nov. 17			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	23.92	15.64	12.74	81.46	176.4	4,219	11.34
P.O.J. 213	23.10	16.07	13.76	85.63	195.6	4,518	10.22
P.O.J. 234	22.69	17.44	15.26	87.50	219.3	4,976	9.12
C.P. 807	33.10	15.91	13.42	84.35	185.5	6,140	10.78
Co. 281	28.17	17.02	14.55	85.49	206.7	5,823	9.68
Co. 290	36.05	16.09	12.87	79.99	186.9	6,738	10.70

[1] For P=0.05, D=±2.12; for P=0.01, D=±2.86.

TABLE 15.—*Results of plant-cane variety tests on Berwick [1] clay, Oaklawn plantation, Franklin, La., 1932*

Variety	Average acre yield of cane [2]	Laboratory-mill juice analyses at harvest, Nov. 30			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 234	15.57	17.34	14.99	86.45	214.1	3,334	9.34
C.P. 807	20.30	17.03	14.65	86.02	204.6	4,153	9.78
Co. 281	17.93	17.47	14.76	84.49	208.4	3,737	9.60
Co. 290	20.70	17.41	14.38	82.60	212.6	4,401	9.41

[1] Tentative classification. [2] For P=0.05, D=±0.94; for P=0.01, D=±1.42.

TABLE 16.—*Results of plant-cane variety tests on Iberia silty clay loam, Albania plantation, Jeanerette, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Nov. 21			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 234	15.14	17.36	15.20	87.56	218.5	3,308	9.15
C.P. 807	23.24	16.49	14.24	86.36	199.2	4,629	10.04
Co. 281	12.40	17.04	14.76	86.62	211.1	2,618	9.47

[1] For P=0.05, D=±5.38; for P=0.01, D=±8.16.

TABLE 17.—*Results of plant-cane variety tests on Sharkey clay, Alma plantation, Lakeland, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Dec. 5			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 234	13.56	15.82	12.99	82.11	180.6	2,449	11.07
C.P. 807	19.20	14.86	12.09	81.36	163.9	3,147	12.20
Co. 281	16.22	15.20	12.11	79.67	165.6	2,686	12.08
Co. 290	23.06	14.45	10.87	75.22	152.2	3,510	13.14

[1] For P=0.05, D=±1.83; for P=0.01, D=±2.53.

TABLE 18.—*Results of plant-cane variety tests on Sharkey heavy silt loam, United States Sugar Plant Field Station, Houma, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Nov. 22			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	28.33	15.42	12.35	80.09	169.4	4,799	11.81
C.P. 27/153	29.17	17.30	13.64	78.84	185.4	5,408	10.79
C.P. 28/11	31.86	18.50	15.37	83.08	210.8	6,716	9.49
C.P. 28/19	32.31	17.93	15.18	84.66	210.2	6,792	9.51

[1] For P=0.05, D=±3.09; for P=0.01, D=±4.45.

TABLE 19.—*Differences in average yields observed between sugarcane varieties in plant-cane tests on heavy soil at different localities in Louisiana*

DIFFERENCES IN YIELDS OF CANE PER ACRE (TONS)

Average yield obtained with—	Minus average yield obtained with—	Raceland (table 12)	Greenwood (table 13)	Houma (table 14)	Oaklawn (table 15)	Albania (table 16)	Alma (table 17)	Average of 6 tests
Co. 290	C.P. 807	+4.48	−0.48	+2.95	+0.40		+3.86	+2.24
	Co. 281	+8.58	+5.50	+7.88	+2.77		+6.84	+6.31
	P.O.J. 234	+12.22	+8.14	+13.36	+5.13		+9.50	+9.67
C.P. 807	Co. 281	+4.10	+5.98	+4.93	+2.37	+10.84	+2.98	+5.20
	P.O.J. 234	+7.74	+8.62	+10.41	+4.73	+8.10	+5.64	+7.54
Co. 281	do	+3.64	+2.64	+5.48	+2.36	−2.74	+2.66	+2.34
Difference for P=0.05		±3.02	±5.22	±2.12	±.94	±5.38	±1.83	±2.60
Difference for P=0.01		±4.18	±7.21	±2.86	±1.42	±8.16	±2.53	±3.60

DIFFERENCES IN INDICATED YIELDS OF 96° SUGAR PER TON OF CANE (POUNDS)

P.O.J. 234	Co. 281	−15.1	+1.9	+12.6	+5.7	+7.4	+15.0	+4.9
	C.P. 807	−1.0	+21.8	+33.8	+9.5	+19.3	+16.7	+17.8
	Co. 290	+9.9	+15.9	+32.4	+1.5		+28.4	+19.7
Co. 281	C.P. 807	+14.1	+19.9	+21.2	+3.8	+11.9	+1.7	+12.8
	Co. 290	+25.0	+14.0	+19.8	−4.2		+13.4	+15.8
C.P. 807	do	+10.9	−5.9	−1.4	−8.0		+11.7	+2.0
Difference for P=0.05								±9.8
Difference for P=0.01								±13.6

DIFFERENCES IN INDICATED YIELDS OF 96° SUGAR PER ACRE (POUNDS)

Co. 290	C.P. 807	+504	+76	+598	+248		+363	+358
	Co. 281	+962	+715	+915	+664		+824	+816
	P.O.J. 234	+1,958	+1,206	+1,762	+1,067		+1,061	+1,411
C.P. 807	Co. 281	+458	+639	+317	+416	+2,011	+461	+717
	P.O.J. 234	+1,454	+1,130	+1,164	+819	+1,321	+698	+1,098
Co. 281	do	+996	+491	+847	+403	−690	+237	+381
Difference for P=0.05								±430
Difference for P=0.01								±595

The results of a test with three promising new seedlings in comparison with P.O.J. 36-M are given in table 18. C.P. 28/11 and C.P. 28/19 gave yields of cane per acre significantly higher than corresponding yields from P.O.J. 36-M, with indicated yields of sugar per ton of cane in excess of 40 pounds higher in each case. The indicated yield of sugar per acre exceeded that from P.O.J. 36-M by approximately 2,000 pounds in each case. C.P. 27/153 gave an average yield of cane slightly but not significantly greater than the yield from P.O.J. 36-M, and an indicated yield of 16 pounds more sugar per ton of cane and 609 pounds more sugar per acre than the yields from this variety. The results from this test are not directly comparable with results with C.P. 807 and Co. 290 from tests of these varieties on Sharkey clay and related types of soil, but serve to indicate that C.P. 28/11 and C.P. 28/19 may prove suitable for culture on these soils.

The results of these tests indicate that both Co. 290 and C.P. 807 satisfactorily tolerate unfavorable drainage and other conditions characteristic of Sharkey clay and related types of soil, the advantage being slightly in favor of Co. 290. Co. 281 appears to be slightly preferable to P.O.J. 234 under these conditions, but the results indicate that both varieties are of doubtful value as compared to either Co. 290 or C.P. 807.

FIRST-STUBBLE TESTS ON LIGHT SOILS

The results of first-stubble variety tests on light soil are given in tables 20 to 25, inclusive.

TABLE 20.—*Results of first-stubble variety tests on Yazoo very fine sandy loam, Godchaux plantation, Raceland, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Nov. 14			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	26.85	15.14	11.75	77.61	158.2	4,248	12.64
P.O.J. 213	25.82	15.36	12.55	81.71	174.0	4,493	11.49
P.O.J. 234	21.06	15.98	13.23	82.79	184.8	3,892	10.82
C.P. 807	38.01	14.87	11.94	80.30	160.7	6,108	12.45
Co. 281	32.94	16.54	13.65	82.53	190.3	6,268	10.51
Co. 290	43.62	15.91	12.51	78.63	179.9	7,847	11.12

[1] For P=0.05, D=±2.55; for P=0.01, D=±3.44.

TABLE 21.—*Results of first-stubble variety tests on Yazoo very fine sandy loam, Greenwood plantation, Thibodaux, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Nov. 16			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	21.76	16.61	14.16	85.25	200.8	4,369	9.96
P.O.J. 213	23.19	16.45	14.14	85.96	201.4	4,670	9.93
P.O.J. 234	22.42	17.46	15.48	88.66	223.9	5,020	8.93
C.P. 807	36.78	16.06	13.82	86.05	193.0	7,099	10.36
Co. 281	28.16	17.43	15.22	87.32	218.5	6,153	9.15
Co. 290	30.36	16.49	13.45	81.56	197.5	5,996	10.13

[1] For P=0.05, D=±3.23; for P=0.01, D=±4.37.

TABLE 22.—*Results of first-stubble variety tests on Crevasse silty clay loam, United States Sugar Plant Field Station, Houma, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Nov. 7			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	19.91	16.28	13.60	83.54	190.9	3,801	10.48
P.O.J. 36	20.80	16.08	13.36	83.08	186.9	3,888	10.70
P.O.J. 213	19.02	16.49	14.17	85.96	201.8	3,838	9.91
P.O.J. 234	17.98	17.76	15.54	87.50	223.3	4,015	8.96
C.P. 807	30.81	16.20	13.53	83.52	186.1	5,734	10.75
Co. 281	22.87	17.34	14.87	85.76	211.6	4,839	9.45

[1] For P=0.05, D=±2.19; for P=0.01, D=±2.96.

TABLE 23.—*Results of first-stubble variety tests on St. Mary* [1] *silt loam, Midway plantation, Bayou Sale (Foster post office), La., 1932*

Variety	Average acre yield of cane [2]	Laboratory-mill juice analyses at harvest, Nov. 8			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	12.82	16.35	13.63	83.36	191.1	2,450	10.47
P.O.J. 213	13.90	16.73	14.42	86.19	205.7	2,859	9.72
P.O.J. 234	13.10	18.05	15.88	87.98	228.8	2,997	8.74
C.P. 807	20.80	16.78	14.45	86.11	201.9	4,200	9.91
Co. 281	13.88	17.29	14.89	86.12	212.3	2,947	9.42
Co. 290	20.46	17.44	14.68	84.17	219.2	4,485	9.12

[1] Tentative classification.
[2] For P=0.05, D=±2.11; for P=0.01, D=±2.85.

TABLE 24.—*Results of first-stubble variety tests on Pharr silt loam, Oaklawn plantation, Franklin, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Nov. 1			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	15.01	16.61	13.70	82.48	191.0	2,867	10.47
P.O.J. 213	15.20	16.10	13.54	84.10	190.7	2,899	10.49
P.O.J. 234	15.03	18.04	15.66	86.81	224.2	3,370	8.92
C.P. 807	27.76	16.59	14.10	84.99	195.7	5,433	10.22
Co. 281	17.65	17.22	14.57	84.61	205.9	3,634	9.71
Co. 290	23.59	17.24	13.97	81.03	204.4	4,822	9.78

[1] For P=0.05, D=±2.38; for P=0.01, D=±3.21.

TABLE 25.—*Differences in average yields observed between sugarcane varieties in first-stubble tests on light soil at different localities in Louisiana*

DIFFERENCES IN YIELDS OF CANE PER ACRE (TONS)

Average yield obtained with—	Minus average yield obtained with—	Raceland (table 20)	Greenwood (table 21)	Houma (table 22)	Oaklawn (table 24)	Bayou Sale (table 23)	Average of 5 tests
C.P. 807	Co. 290	−5.61	+6.42		+4.17	+0.34	+1.33
	Co. 281	+5.07	+8.62	+7.94	+10.11	+6.92	+7.73
	P.O.J. 213	+12.19	+13.59	+11.79	+12.56	+6.90	+11.41
	P.O.J. 36-M	+11.16	+15.02	+10.90	+12.75	+7.98	+11.56
	P.O.J. 234	+16.95	+14.36	+12.83	+12.73	+7.70	+12.91
Co. 290	Co. 281	+10.68	+2.20		+5.94	+6.58	+6.35
	P.O.J. 213	+17.80	+7.17		+8.39	+6.56	+9.98
	P.O.J. 36-M	+16.77	+8.60		+8.58	+7.64	+10.40
	P.O.J. 234	+22.56	+7.94		+8.56	+7.36	+11.60
Co. 281	P.O.J. 213	+7.12	+4.97	+3.85	+2.45	+.02	+3.67
	P.O.J. 36-M	+6.09	+6.40	+2.96	+2.64	+1.06	+3.83
	P.O.J. 234	+11.88	+5.74	+4.99	+2.62	+.78	+5.18
P.O.J. 213	P.O.J. 36-M	−1.03	+1.43	−.89	+.19	+1.08	+.16
	P.O.J. 234	+4.76	+.77	+1.04	+.17	+.80	+1.51
P.O.J. 36-M	do	+5.79	−.66	−1.93	−.02	−.28	+1.35
Difference for P=0.05		±2.55	±3.23	±1.93	±2.38	±2.11	±3.21
Difference for P=0.01		±3.44	±4.37	±2.96	±3.21	±2.85	±4.38

TABLE 25.—*Differences in average yields observed between sugarcane varieties in first-stubble tests on light soil at different localities in Louisiana*—Continued

DIFFERENCES IN INDICATED YIELD OF 96° SUGAR PER ACRE (POUNDS)

Average yield obtained with—	Minus average yield obtained with—	Raceland (table 20)	Greenwood (table 21)	Houma (table 22)	Oaklawn (table 24)	Bayou Sale (table 23)	Average of 5 tests
Co. 290	C.P. 807	+1,739	−1,103		−611	+285	+775
	Co. 281	+1,579	−157		+1,188	+1,538	+1,037
	P.O.J. 234	+3,955	+976		+1,452	+1,488	+1,968
	P.O.J. 213	+3,354	+1,326		+1,923	+1,626	+2,057
	P.O.J. 36-M	+3,599	+1,627		+1,955	+2,035	+2,304
C. P. 807	Co. 281	−160	+946	+895	+1,799	+1,253	+947
	P.O.J. 234	+2,216	+2,079	+1,719	+2,063	+1,203	+1,856
	P.O.J. 213	+1,615	+2,429	+1,896	+2,534	+1,341	+1,963
	P.O.J. 36-M	+1,860	+2,730	+1,933	+2,566	+1,750	+2,168
Co. 281	P.O.J. 234	+2,376	+1,133	+824	+264	−50	+909
	P.O.J. 213	+1,775	+1,483	+1,001	+735	+88	+1,016
	P.O.J. 36-M	+2,020	+1,784	+1,038	+767	+497	+1,221
P.O.J. 234	P.O.J. 213	−601	+350	+177	+471	+138	+107
	P.O.J. 36-M	−356	+651	+214	+503	+547	+312
P.O.J. 213	do	+245	+301	+37	+32	+409	+205
Difference for P=0.05							±659
Difference for P=0.01							±899

DIFFERENCES IN INDICATED YIELDS OF 96° SUGAR PER TON OF CANE (POUNDS)

P.O.J. 234	Co. 281	−5.5	+5.4	+11.7	+18.3	+16.5	+9.0
	Co. 290	+4.9	+26.4		+19.8	+9.6	+17.3
	P.O.J. 213	+10.8	+22.5	+21.5	+33.5	+23.1	+22.3
	C.P. 807	+24.1	+30.9	+37.2	+28.5	+26.9	+30.0
	P.O.J. 36-M	+26.6	+23.1	+32.4	+33.2	+37.7	+31.3
Co. 281	Co. 290	+10.4	+21.0		+1.5	−6.9	+9.0
	P.O.J. 213	+16.3	+17.1	+9.8	+15.2	+6.6	+13.3
	C.P. 807	+29.6	+25.5	+25.5	+10.2	+10.4	+21.0
	P.O.J. 36-M	+32.1	+17.7	+20.7	+14.9	+21.2	+22.3
Co. 290	P.O.J. 213	+5.9	−3.9		+13.7	+13.5	+5.1
	C.P. 807	+19.2	+4.5		+8.7	+17.3	+10.9
	P.O.J. 36-M	+21.7	−3.3		+13.4	+28.1	+13.8
P.O.J. 213	C.P. 807	+13.3	+8.4	+15.7	−5.0	+3.8	+7.7
	P.O.J. 36-M	+15.8	+.6	+10.9	−.3	+14.6	+9.0
C.P. 807	do	+2.5	−7.8	−4.8	+4.7	+10.8	+1.3
Difference for P=0.05							±7.61
Difference for P=0.01							±10.38

The small number of replications rendered necessary by the limited quantity of Co. 290 available for seed is considered largely responsible for the lack of uniformity observed in cane yields obtained with this variety in comparison with those obtained with C.P. 807. In one test (Godchaux plantation, table 20) Co. 290 outyielded C.P. 807 in tons of cane per acre and in pounds of sugar per ton of cane and per acre. In the average of the four tests C.P. 807 slightly outyielded Co. 290 in cane per acre, but the indicated yield of sugar per ton of cane from Co. 290 exceeded that from C.P. 807 by the significant difference of 10 pounds, giving an average indicated yield of sugar per acre nearly 800 pounds in excess of the corresponding yield obtained from C.P. 807. Indicated yields of sugar per ton of cane from Co. 290 were higher than corresponding ones observed from either P.O.J. 213 or P.O.J. 36-M, in 3 out of 4 tests, with both average differences in favor of Co. 290, and definitely significant in the comparison involving P.O.J. 36-M. They were lower than corresponding ones of Co. 281 in 3 out of 4 tests, with an average difference of 9 pounds in favor of Co. 281. They were consistently under comparative indicated yields from P.O.J. 234, with an average difference of 17.3 pounds.

C.P. 807 gave significantly greater yields of cane per acre than either Co. 281, P.O.J. 36-M, P.O.J. 213, or P.O.J. 234, in all tests, with indicated yields of sugar per ton of cane on the average slightly higher than corresponding yields from P.O.J. 36-M, but somewhat lower than those from P.O.J. 213. Its indicated yield of sugar per ton of cane was consistently lower than corresponding ones from P.O.J. 234 and Co. 281, with an average difference of 30 pounds as compared with P.O.J. 234, and 21 pounds as compared with Co. 281. C.P. 807 showed an average indicated yield of sugar per acre consistently higher than corresponding yields obtained from either P.O.J. 36-M, P.O.J. 213, or P.O.J. 234, the difference in the average of all tests being approximately 1 ton of 96° sugar in each case. Its indicated yield of sugar per acre was in excess of comparative ones obtained from Co. 281 in 4 out of 5 tests, with an average difference of 947 pounds in favor of C.P. 807.

Yields of cane per acre obtained with Co. 281 were significantly higher than comparative yields of either P.O.J. 36-M, P.O.J. 213, or P.O.J. 234 at Raceland, Greenwood, and Houma, while the corresponding differences at Oaklawn and Bayou Sale were apparently all within the range of experimental error, bearing out previous observations to the effect that Co. 281 is relatively better adapted to conditions in the parishes east of the Atchafalaya River. The indicated yields of sugar per ton of cane in the case of Co. 281 were lower than the comparative yields observed with P.O.J. 234 in 4 out of 5 tests, and lower by 9 pounds on the average. It was higher than comparative yields of either P.O.J. 36-M or P.O.J. 213 in all tests. It showed a higher indicated yield of sugar per acre than either P.O.J. 213, P.O.J. 36-M, or P.O.J. 234, in 14 out of 15 of the comparisons involved, with an average difference of 909 pounds as compared to P.O.J. 234, 1,016 pounds as compared to P.O.J. 213, and 1,221 pounds as compared to P.O.J. 36-M.

Observed differences in yields of cane per acre between P.O.J. 36-M, P.O.J. 213, and P.O.J. 234 are, on the whole, too small to be considered to have any significance. In the Raceland test (table 20) P.O.J. 234 gave an average yield of cane per acre definitely lower than that from either P.O.J. 213 or P.O.J. 36-M, but maintained its usual superiority in indicated yield of sugar per ton of cane over these two varieties in the 5 tests, showing an average difference of 22.3 pounds in comparison with P.O.J. 213, and 31.3 pounds in comparison with P.O.J. 36-M. Its indicated yield of sugar per acre at Raceland was lower than the yield from P.O.J. 213 or P.O.J. 36-M; in each of the 4 other tests it outyielded these varieties, though the average increase was only 107 pounds more than P.O.J. 213 and 312 pounds more than P.O.J. 36-M.

FIRST-STUBBLE TESTS ON HEAVY SOILS

The results of first-stubble tests on heavy soils are shown in tables 26 to 31, inclusive.

TABLE 26.—*Results of first-stubble variety tests on Sharkey clay, Godchaux plantation, Raceland, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Nov. 15			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 213	20.80	15.20	13.10	86.19	186.8	3,885	10.71
C.P. 807	30.84	16.51	14.29	86.55	200.2	6,174	9.99
Co. 281	20.40	17.24	14.73	85.44	209.2	4,268	9.56

[1] For P=0.05, D=±5.89; for P=0.01, D=±8.37.

TABLE 27.—*Results of first-stubble variety tests on Sharkey clay, Greenwood plantation, Thibodaux, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Nov. 16			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 213	21.19	16.18	13.74	84.92	194.5	4,121	10.28
C.P. 807	28.97	15.93	13.51	84.81	187.3	5,426	10.68
Co. 281	25.78	16.66	14.06	84.39	198.4	5,115	10.08

[1] For P=0.05, D=±4.17; for P=0.01, D=±5.93.

TABLE 28.—*Results of first-stubble variety tests on Sharkey clay, United States Sugar Plant Field Station, Houma, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Nov. 14–16			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36	17.12	15.57	12.67	81.37	175.3	3,001	11.41
P.O.J 36-M	15.57	15.63	12.81	81.96	177.9	2,770	11.24
P.O.J. 213	16.12	16.12	13.81	85.67	196.4	3,166	10.18
C.P. 807	25.13	16.40	14.13	86.16	197.5	4,963	10.13
Co. 281	18.93	17.16	14.42	84.03	203.0	3,843	9.85
Co. 290	26.83	16.51	13.51	81.83	198.7	5,331	10.07

[1] For P=0.05, D=±2.36; for P=0.01, D=±3.19.

TABLE 29.—*Results of first-stubble variety tests on Sharkey clay, Crescent farm, Houma, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Nov. 11			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	13.99	15.99	13.21	82.61	184.3	2,578	10.85
P.O.J. 213	14.25	16.12	13.73	85.17	194.7	2,774	10.27
P.O.J. 234	17.93	17.94	15.74	87.74	226.5	4,061	8.83
C.P. 807	31.76	15.06	12.25	81.34	166.1	5,275	12.04
Co. 281	20.71	16.29	13.53	83.06	189.3	3,920	10.57

[1] For P=0.05, D=±5.54; for P=0.01, D=±7.56.

TABLE 30.—*Results of first-stubble variety tests on Berwick [1] clay, Oaklawn plantation, Franklin, La., 1932*

Variety	Average acre yield of cane [2]	Laboratory-mill juice analyses at harvest, Nov. 30			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 213	13.54	14.94	12.50	83.67	175.6	2,378	11.39
C.P. 807	23.00	15.98	13.73	85.92	191.6	4,407	10.44
Co. 281	16.64	17.12	14.26	83.29	199.8	3,325	10.01

[1] Tentative classification.
[2] For P=0.05, D=±3.61; for P=0.01, D=±5.14.

TABLE 31.—*Differences in average yields observed between sugarcane varieties in first-stubble tests on heavy soil at different localities in Louisiana*

DIFFERENCES IN YIELDS OF CANE PER ACRE (TONS)

Average yield obtained with—	Minus average yield obtained with—	Raceland (table 26)	Greenwood (table 27)	Houma (table 28)	Crescent farm (table 29)	Oaklawn (table 30)	Average of 5 tests
C.P. 807	Co. 281	+10.44	+3.19	+6.20	+11.05	+6.36	+7.45
	P.O.J. 213	+10.04	+7.78	+9.01	+17.51	+9.46	+10.76
Co. 281	do	−.40	+4.59	+2.81	+6.46	+3.10	+3.31
Difference for P=0.05		±5.98	±4.17	±2.36	±5.54	±3.61	±3.37
Difference for P=0.01		±8.37	±5.93	±3.19	±7.56	±5.14	±4.90

DIFFERENCES IN INDICATED YIELDS OF 96° SUGAR PER TON OF CANE (POUNDS)

Co. 281	P.O.J. 213	+22.4	+3.9	+6.6	−5.4	+24.2	+9.8
	C.P. 807	+9.0	+11.1	+5.5	+23.2	+8.2	+1.9
P.O.J. 213	do	−13.4	+7.2	−1.1	+28.6	−16.0	+2.1
Difference for P=0.05							±13.7
Difference for P=0.01							±20.0

DIFFERENCES IN INDICATED YIELDS OF 96° SUGAR PER ACRE (POUNDS)

C.P. 807	Co. 281	+1,906	+311	+1,120	+1,355	+1,082	+1,155
	P.O.J. 213	+2,289	+1,305	+1,797	+2,501	+2,029	+1,984
Co. 281	do	+383	+994	+677	+1,146	+947	+829
Difference for P=0.05							±410
Difference for P=0.01							±597

These results continue to indicate the relative superiority of C.P. 807 to P.O.J. 213 and Co. 281, under the conditions involved, and afford additional evidence that C.P. 807 can be satisfactorily grown under relatively poor drainage conditions. The indicated yield of sugar per ton of cane from C.P. 807 ranged from 5.5 to 23.2 pounds less than the yield from Co. 281, averaging 11.9 pounds less for the 5 tests; in 3 of the tests it yielded from 1.1 to 16.0 pounds more and in 2 of the tests from 7.2 to 28.6 pounds less sugar per ton than P.O.J. 213, the average for all tests being only 2.1 pounds less. Its indicated yield of sugar per acre was consistently greater than that from either Co. 281 or P.O.J. 213, ranging from 311 to 1,906 pounds more than Co. 281 and from 1,305 to 2,501 pounds more than P.O.J. 213, and averaging 1,155 pounds more than the former variety and 1,984 pounds more than the latter.

Co. 281 gave yields of cane and indicated yields of sugar somewhat more satisfactory, on the whole, than corresponding yields from P.O.J. 213, but the differences are not large, and the results of the test are in general agreement with the results of tests of plant cane on heavy soil herein reported and the results previously reported (*6*) in indicating that this variety is not well adapted for culture on Sharkey clay and related types of soil.

Results obtained with P.O.J. 213, P.O.J. 234, and P.O.J. 36-M afford further evidence that these varieties are not very well adapted for culture on Sharkey clay.

Co. 290, in a test at Houma (table 28), gave an average yield of cane per acre and an indicated yield of sugar per ton of cane and per acre slightly higher than corresponding yields obtained with C.P. 807, but the differences are within the range of experimental error and do not serve to indicate superiority of Co. 290 under the conditions of the test.

SECOND-STUBBLE TESTS

The results of 5 second-stubble variety tests, 4 of which were conducted on light soil, and the other on Sharkey clay, are given in tables 32 to 37, inclusive.

TABLE 32.—*Results of second-stubble variety tests on Yazoo very fine sandy loam, Godchaux plantation, Raceland, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Oct. 24			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	16.12	16.49	13.31	80.72	183.3	2,955	10.91
P.O.J. 213	17.28	16.19	13.20	81.53	182.8	3,159	10.94
P.O.J. 234	16.53	17.31	14.60	84.34	205.9	3,404	9.71
C.P. 807	26.65	16.46	14.05	85.36	195.4	5,207	10.24
Co. 281	17.95	17.14	13.63	79.52	186.1	3,340	10.75
C.P. 177	13.24	16.16	12.88	79.70	176.1	2,332	11.36
C.P. 766	24.75	16.31	12.97	79.52	177.1	4,383	11.29

[1] For P=0.05, D=±2.85; for P=0.01, D=±3.84.

TABLE 33.—*Results of second-stubble variety tests on Yazoo very fine sandy loam, Greenwood plantation, Thibodaux, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Oct. 26			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	13.53	15.73	13.01	82.71	181.6	2,457	11.01
P.O.J. 213	17.52	15.64	13.04	83.38	182.8	3,203	10.94
P.O.J. 234	15.47	17.05	14.67	86.04	209.1	3,235	9.56
C.P. 807	30.45	16.01	13.33	83.26	183.0	5,572	10.93
Co. 281	19.90	17.27	14.70	85.12	208.3	4,145	9.60
C.P. 177	17.43	16.04	12.85	80.11	176.2	3,071	11.35
C.P. 766	24.93	16.20	12.84	79.26	175.0	4,363	11.43

[1] For P=0.05, D=±3.47; for P=0.01, D=±4.67.

TABLE 34.—*Results of second-stubble variety tests on light soil, United States Sugar Plant Field Station, Houma, La., 1932*

Group and variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Oct. 29			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
Group 1: [2]	*Tons*		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 213	17.73	15.70	13.21	84.14	186.1	3,300	10.75
C.P. 807	28.35	15.70	13.07	83.25	179.4	5,086	11.15
Co. 281	21.93	16.53	13.67	82.70	190.8	4,184	10.48
C.P. 177	19.54	15.56	12.40	79.69	169.6	3,314	11.79
C.P. 766	24.88	15.29	12.05	78.81	163.7	4,073	12.22
Group 2: [3]							
P.O.J. 36	16.65	15.31	12.44	81.25	172.0	2,864	11.63
P.O.J. 36-M	18.86	15.53	12.69	81.71	176.0	3,319	11.36
P.O.J. 213	16.96	15.46	12.81	82.86	179.0	3,036	11.17
P.O.J. 234	14.71	16.70	14.26	85.39	202.4	2,977	9.88
C.P. 71-B	7.96	16.34	13.50	82.62	188.3	1,499	10.62

[1] For group 1, P=0.05, D=±1.33; P=0.01, D=±1.83. For groups 2, P=0.05, D=±2.47; P=0.01, D=±3.41.
[2] On Yazoo silt loam.
[3] On Yazoo silty clay loam and Crevasse silty clay loam.

TABLE 35.—*Results of second-stubble variety tests on Iberia silt loam and related types, Cypremort plantation, Louisa, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Nov. 24			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	13.07	16.91	14.77	87.34	212.1	2,772	9.43
P.O.J. 213	11.20	15.86	13.47	84.93	190.7	2,136	10.49
P.O.J. 234	11.99	17.35	15.20	87.61	218.6	2,621	9.15
C.P. 807	19.84	16.92	14.63	86.47	204.8	4,063	9.77
Co. 281	13.20	17.59	15.36	87.32	220.5	2,911	9.07

[1] For P=0.05, D=±1.35; for P=0.01, D=±1.83.

TABLE 36.—*Results of second-stubble variety tests on heavy soil, United States Sugar Plant Field Station, Houma, La., 1932*

Group and variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Oct. 27–28			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
Group 1: [2]	*Tons*		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36	18.75	15.35	12.40	80.78	170.9	3,204	11.70
P.O.J. 36-M	18.77	15.77	12.90	81.80	179.0	3,360	11.17
P.O.J. 213	16.24	15.78	13.23	83.84	186.0	3,021	10.75
P.O.J. 234	18.48	17.03	14.50	85.14	205.5	3,798	9.73
C.P. 71-B	10.58	16.19	13.00	80.30	178.5	1,889	11.20
Group 2: [3]							
P.O.J. 213	16.94	16.13	13.73	85.12	194.6	3,297	10.28
C.P. 807	27.21	15.60	12.97	83.14	177.9	4,841	11.24
Co. 281	17.95	16.43	13.65	83.08	191.0	3,428	10.47
C.P. 177	15.47	15.96	12.78	80.08	175.2	2,710	11.42
C.P. 766	22.79	15.55	12.08	77.68	162.7	3,708	12.29

[1] For group 1, P=0.05, D=±4.16; P=0.01, D=±5.73. For group 2, P=0.05, D=±5.62; P=0.01, D=±7.74.
[2] On Sharkey clay with small body of Crevasse silty clay loam.
[3] On Sharkey clay.

TABLE 37.—*Differences in average yields observed between sugarcane varieties in second-stubble tests on light soil at different localities in Louisiana*

DIFFERENCES IN YIELDS OF CANE PER ACRE (TONS)

Average yield obtained with—	Minus average yield obtained with—	Raceland (table 32)	Greenwood (table 33)	Houma (table 34)	Cypremort (table 35)	Average of four tests
C.P. 807	Co. 281	+8.70	+10.55	+6.42	+6.64	+8.08
	P.O.J. 213	+9.37	+12.93	+10.62	+8.64	+10.39
	P.O.J. 36-M	+10.53	+16.92	+9.49	+6.77	+10.93
	P.O.J. 234	+10.12	+14.98	+13.64	+7.85	+11.65
Co. 281	P.O.J. 213	+.67	+2.38	+4.20	+2.00	+2.31
	P.O.J. 36-M	+1.83	+6.37	+3.07	+.13	+2.85
	P.O.J. 234	+1.42	+4.43	+7.22	+1.21	+3.57
P.O.J. 213	P.O.J. 36-M	+1.16	+3.99	−1.90	−1.87	+.34
	P.O.J. 234	+.75	+2.05	+2.25	−.79	+1.06
P.O.J. 36-M	do	−.41	−1.94	+4.15	+1.08	+.72
Difference for P=0.05		±2.85	±3.47	±2.47	±1.35	±3.32
Difference for P=0.01		±3.84	±4.67	±3.41	±1.83	±4.55

DIFFERENCES IN YIELDS OF 96° SUGAR PER TON OF CANE (POUNDS)

P.O.J. 234	Co. 281	+19.8	+0.8	+11.6	−1.9	+8.7
	C.P. 807	+10.5	+26.1	+23.0	+13.8	+19.2
	P.O.J. 36-M	+22.6	+27.5	+26.4	+6.5	+20.8
	P.O.J. 213	+23.1	+26.3	+23.4	+27.9	+25.2
Co. 281	C.P. 807	−9.3	+25.3	+11.4	+15.7	+10.5
	P.O.J. 36-M	+2.8	+26.7	+14.8	+8.4	+13.0
	P.O.J. 213	+3.3	+25.5	+4.7	+29.8	+14.7
C.P. 807	P.O.J. 36-M	+12.1	+1.4	+3.4	−7.3	+2.5
	P.O.J. 213	+12.6	+.2	−6.7	+14.1	+4.1
P.O.J. 36-M	do	+.5	−1.2	−3.0	+21.4	+3.6
Difference for P=0.05						±11.1
Difference for P=0.01						±15.3

DIFFERENCES IN YIELDS OF 96° SUGAR PER ACRE (POUNDS)

C.P. 807	Co. 281	+1,867	+1,427	+902	+1,152	+1,337
	P.O.J. 234	+1,803	+2,337	+2,109	+1,442	+1,923
	P.O.J. 213	+2,048	+2,369	+1,786	+1,927	+2,032
	P.O.J. 36-M	+2,252	+3,115	+1,767	+1,291	+2,106
Co. 281	P.O.J. 234	−64	+910	+1,207	+290	+586
	P.O.J. 213	+181	+942	+884	+775	+695
	P.O.J. 36-M	+385	+1,688	+865	+139	+769
P.O.J. 234	P.O.J. 213	+245	+32	−59	+485	+176
	P.O.J. 36-M	+449	+778	−342	−151	+183
P.O.J. 213	do	+204	+746	−283	−636	+8
Difference for P=0.05						±576
Difference for P=0.01						±789

C.P. 807 again displayed its remarkable stubbling qualities by giving yields of cane per acre larger by all odds than comparative ones obtained with either P.O.J. 36-M, P.O.J. 213, P.O.J. 234, or Co. 281. In the four tests on light soil its average yield of 26.32 tons of cane was more than 10 tons in excess of corresponding yields of either P.O.J. 213, P.O.J. 36-M, or P.O.J. 234, and 8 tons in excess of the average yield obtained with Co. 281. Its average indicated yield of sugar per ton of cane was slightly in excess of comparative yields obtained with either P.O.J. 36-M or P.O.J. 213. It was approximately 10 pounds under the corresponding yield obtained with Co. 281 and 19 pounds under that obtained with P.O.J. 234. In these four tests its indicated yield of sugar per acre was approximately 2,000 pounds in excess of the corresponding yields obtained with either P.O.J. 36-M, P.O.J. 234, or P.O.J. 213, and over 1,300 pounds in excess of the average yield obtained with Co. 281. Results in general agreement with the above were obtained with this variety in the one test on Sharkey clay (table 36).

Co. 281, in the tests on light soil, gave yields of cane per acre consistently larger than corresponding yields obtained with either P.O.J. 213, P.O.J. 36-M, or P.O.J. 234, although only six of the observed differences (in tests at Greenwood, table 33, and Houma, table 34) were sufficiently large to be considered significant. In the average of the four tests its indicated yield of sugar per ton of cane was 14.7 pounds in excess of that from P.O.J. 213, 13 pounds in excess of that from P.O.J. 36-M, and 8.7 less than that from P.O.J. 234. It gave an average indicated yield of sugar per acre exceeding that obtained with either P.O.J. 234, P.O.J. 213, or P.O.J. 36-M by differences ranging from 586 to 769 pounds. In one test on Sharkey clay (table 36) its yield of cane per acre and indicated yield of sugar per ton of cane did not differ significantly from corresponding yields obtained with P.O.J. 213, P.O.J. 36-M, or P.O.J. 234.

The yields of cane per acre obtained with P.O.J. 213, P.O.J. 234, and P.O.J. 36-M in the four tests on light soil were in general very similar. Except in one case (table 34), where the yield obtained with P.O.J. 36-M was 4.15 tons in excess of that obtained with P.O.J. 234, none of the observed differences are significant. P.O.J. 234 displayed its usual superiority with respect to indicated yield of sugar per ton of cane, outyielding P.O.J. 213 by 25.2 pounds and P.O.J. 36-M by 20.8 pounds in the average of the four tests. Its indicated yield of sugar per acre averaged slightly higher than corresponding yields obtained with either P.O.J. 36-M or P.O.J. 213. The average yields of sugar per acre obtained with P.O.J. 213 and P.O.J. 36-M were almost identical. P.O.J. 213 gave relatively better yields than P.O.J. 36-M in the eastern parishes, while the opposite was true in tests west of the Atchafalaya River. C.P. 71-B, C.P. 177, and C.P. 766 again proved definitely inferior to C.P. 807, and C.P. 71-B and C.P. 177 inferior to P.O.J. 36-M, P.O.J. 213, and P.O.J. 234. C.P. 766, while consistently lower in sugar per ton of cane than P.O.J. 36-M, P.O.J. 213, or P.O.J. 234, gave better yields of cane and sugar per acre than these varieties. However, the results confirm previous conclusions that neither C.P. 71-B, C.P. 177, nor C.P. 766 merit consideration for commercial culture in Louisiana.

THIRD- AND FOURTH-YEAR STUBBLE TESTS

It has not been found profitable, as a rule, under Louisiana conditions, to cultivate P.O.J. varieties of sugarcane beyond the second-stubble crop. Owing to favorable weather conditions during the 1931–32 winter, a considerable portion of the third-stubble acreage showed sufficiently good stands to warrant being kept in cultivation. Third-stubble stands in three of the variety tests were found satisfactory for continued cultivation. Observations were also continued on the fourth-stubble crop of a variety test at Houma to obtain additional information as to the previously indicated capacities of C.P. 807 and Co. 281 for prolonged stubbling. The results of these tests are given in tables 38 to 41, inclusive.

TABLE 38.—*Results of third-stubble variety tests on Yazoo very fine sandy loam, Greenwood plantation, Thibodaux, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Oct. 20			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36	21.78	14.30	10.54	73.71	137.4	2,993	14.56
P.O.J. 36-M	19.48	14.59	10.82	74.16	141.6	2,758	14.12
P.O.J. 213	25.52	15.03	11.61	77.25	155.9	3,979	12.83
P.O.J. 234	19.42	16.08	12.62	78.48	171.0	3,321	11.70
P.O.J. 2725	18.78	14.08	9.89	70.24	124.8	2,344	16.03

[1] For P=0.05, D=±4.27; for P=0.01, D=±5.79.

TABLE 39.—*Results of third-stubble variety tests on Yazoo silt loam with slight interlacing of Sharkey silt loam, United States Sugar Plant Field Station, Houma, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Oct. 24			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36	18.22	15.06	12.11	80.41	166.4	3,032	12.02
P.O.J. 36-M	16.86	15.32	12.38	80.81	170.6	2,876	11.72
P.O.J. 213	18.18	15.38	12.56	81.66	174.1	3,165	11.49
C.P. 807	31.87	15.55	12.74	81.93	173.4	5,526	11.53
Co. 281	21.58	16.69	13.93	83.46	195.4	4,217	10.24
C.P. 177	14.31	15.57	12.26	78.74	166.5	2,383	12.01

[1] For P=0.05, D=±3.85; for P=0.01, D=±5.21.

TABLE 40.—*Results of third-stubble variety tests on Crevasse silty clay loam, United States Sugar Plant Field Station, Houma, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Oct. 17–18			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36-M	13.54	14.80	11.40	77.03	152.8	2,069	13.09
P.O.J. 213	14.36	15.32	12.47	81.40	172.6	2,479	11.59
C.P. 807	25.15	14.93	12.19	81.65	165.6	4,165	12.08
Co. 281	15.01	16.00	12.99	81.19	179.5	2,694	11.14
C.P. 177	16.61	15.71	12.28	78.17	166.0	2,757	12.05

[1] For P=0.05, D=±3.80; for P=0.01, D=±5.32.

TABLE 41.—*Results of fourth-stubble tests on Yazoo silt loam, United States Sugar Plant Field Station, Houma, La., 1932*

Variety	Average acre yield of cane [1]	Laboratory-mill juice analyses at harvest, Oct. 19			Indicated available 96° sugar at harvest		Cane for 1 ton of sugar
		Brix	Sucrose	Purity	Per ton of cane	Per acre	
	Tons		*Percent*		*Pounds*	*Pounds*	*Tons*
P.O.J. 36	7.62	14.60	11.01	75.41	145.7	1,110	13.73
P.O.J. 36-M	7.66	15.04	11.63	77.33	156.2	1,196	12.80
C.P. 807	33.12	14.98	11.78	78.64	156.6	5,187	12.77
Co. 281	20.07	16.08	12.82	79.73	175.3	3,518	11.41
C.P. 177	15.69	14.83	11.19	75.46	148.1	2,324	13.50

[1] For P=0.05, D=±3.84; for P=0.01, D=±5.29.

C.P. 807 gave an average yield of 28.51 tons of cane and an average indicated yield of 4,846 pounds of sugar per acre in the two third-year stubble tests and a yield of 33.12 tons of cane and 5,187 pounds of sugar in the single fourth-year stubble test. Its average indicated yield of sugar per ton of cane was 165.2 pounds. The very satisfactory stubbling qualities of C.P. 807 in comparison with P.O.J. 36-M and P.O.J. 213 are again borne out by the results of these tests, in which as third stubble it outyielded these varieties by 10 to 15 tons of cane per acre and as fourth stubble it outyielded P.O.J. 36-M by 25 tons per acre. Indicated yields of sugar per ton of cane from C.P. 807 did not differ materially from those from P.O.J. 36-M and P.O.J. 213. The indicated yield of sugar per acre from C.P. 807 third stubble ranged from 1,600 to 2,600 pounds more than the yields from P.O.J. 36-M and P.O.J. 213, and as fourth stubble it yielded nearly 4,000 pounds more than P.O.J. 36-M.

C.P. 807 also outyielded Co. 281 by an average of 10.22 tons of cane per acre in the two third-stubble tests and by 13.05 tons in the single fourth-stubble test, and in spite of its indicated yield of sugar per ton of cane ranging from 14 to 22 pounds less than that from Co. 281 it outyielded this variety by an average of 1,390 pounds of sugar per acre as third stubble and by 1,669 pounds as fourth stubble.

The average yield of 18.29 tons of cane per acre from Co. 281 third stubble was only slightly higher than the yields from P.O.J. 36-M and P.O.J. 213, though in the test at Houma (table 39) it outyielded P.O.J. 36-M by the significant difference of 4.7 tons. Largely as a result of its consistently higher sugar per ton of cane, Co. 281 outyielded P.O.J. 36-M by an average of 983 pounds of sugar per acre and P.O.J. 213 by an average of 634 pounds. In the fourth-stubble test Co. 281 outyielded P.O.J. 36-M by more than 12 tons of cane and by more than 2,300 pounds of sugar per acre.

P.O.J. 234 in a single third-stubble test at Greenwood (table 38) gave an average yield of cane per acre not significantly different from the corresponding yield from either P.O.J. 36 or P.O.J. 36-M, but 6.10 tons lower than that from P.O.J. 213. It displayed its usual superior qualities as to indicated yield of sugar per ton of cane, giving 328 to 563 pounds more sugar per acre than the former varieties and only 658 pounds less than P.O.J. 213.

Yields of cane per acre obtained with P.O.J. 213 third stubble did not differ materially from corresponding yields of either P.O.J. 36 or P.O.J. 36-M, except in one test at Greenwood (table 38), where its

yield was 6.04 tons higher than the corresponding yield of P.O.J. 36-M. In all cases P.O.J. 213 gave higher indicated yields of sugar per ton of cane and per acre than either P.O.J. 36 or P.O.J. 36-M.

The yield of cane per acre obtained with P.O.J. 36-M did not in any case differ significantly from that obtained with P.O.J. 36. The difference in indicated yield of sugar per ton of cane was comparatively small in all cases, but consistently in favor of P.O.J. 36-M. Relatively unsatisfactory results were obtained with C.P. 177 and P.O.J. 2725.

Inasmuch as weather conditions during 1931–32 were extremely favorable and therefore such as not to reveal possible differences in stubbling qualities between varieties, the comparative results obtained in the above tests cannot be regarded as strictly representative. Under normal conditions in Louisiana the third-stubble crop has usually proved a complete failure in the case of P.O.J. 234 and definitely unprofitable with P.O.J. 213, P.O.J. 36, and P.O.J. 36-M. C.P. 807 and in some instances Co. 281 have afforded definite evidence of much more satisfactory stubbling qualities, indicating in the case of the former variety in particular the probability of its giving satisfactory yields as third stubble and the possibility of its giving satisfactory yields as fourth stubble.

SUMMARY AND CONCLUSIONS

The results of the foregoing tests must necessarily be interpreted in the light of existing conditions, which cannot be regarded as entirely representative. Owing to favorable weather conditions prevailing during the winter of 1931–32, important varietal weaknesses, especially with regard to stubbling qualities, did not manifest themselves as strongly as under normal conditions. As an additional factor, favorable ripening conditions during the fall months permitted cane of all varieties, and particularly late-ripening ones such as Co. 290, to reach a stage of maturity that cannot be considered characteristic of Louisiana conditions.

Under prevailing conditions, the comparative inferiority of P.O.J. 213, P.O.J. 234, and P.O.J. 36-M to the more recently introduced C.P. 807 and Co. 281, and to Co. 290, as to vigor and general desirability is strikingly borne out. Inasmuch as generally similar comparative results were obtained in previous tests with C.P. 807 and Co. 281 in comparison with the above-mentioned P.O.J. varieties, it would seem that the information is sufficiently conclusive to warrant the extensive substitution of C.P. 807 and Co. 281 for the P.O.J. varieties under appropriate soil conditions.

C.P. 807 has consistently outyielded the heretofore favorite P.O.J. varieties by approximately 10 tons or more of cane per acre. Its indicated yields of sugar per ton of cane compared favorably with those from P.O.J. 36-M and P.O.J. 213 in tests made in previous years and were as high as or higher than the yields from these varieties in more than 50 percent of the comparative tests made in 1932, the average of all comparative plant and stubble tests showing an indicated yield of 186.9 pounds from C.P. 807 as compared with 183.0 pounds from P.O.J. 36-M and an indicated yield of 187.7 pounds as compared with 188.4 pounds from P.O.J. 213. C.P. 807 has proved suitable for culture on various types of soil in Louisiana and appears especially well adapted for culture on Sharkey clay and related types

of poorly drained soils which have long been utilized for growing cane but on which production from previously available varieties has been hazardous as a result of the low yields which, under other than exceptionally favorable conditions, have usually been obtained. Its satisfactory yields and stubbling qualities, its extreme resistance to if not immunity from the mosaic disease, its resistance to red rot under field conditions, and especially its resistance to root diseases appear to outweigh completely its unfavorable characteristics of crookedness of stalk and somewhat higher fiber content than that of P.O.J. 36-M, P.O.J. 213, and P.O.J. 234. Its vigor should appeal in particular to growers in the parishes of St. Mary, Iberia, and Vermilion, where low yields of cane are usually obtained and where for the last few years unfavorable weather conditions during the growing season, beetle damage, and possibly other factors have rendered the yield problem a very serious one.

Co. 281 gave consistently lower yields of cane per acre and consistently higher indicated sugar per ton of cane than C.P. 807. As a result of its higher sugar per ton of cane it gave indicated yields of sugar per acre as plant cane that compared favorably with the yields from C.P. 807, but as stubble cane, especially third and fourth stubble, it gave much lower yields than C.P. 807. Its average yield per acre for all comparative plant-cane tests was 6 tons of cane and 700 pounds of sugar less than the average yields from C.P. 807 and for all comparative stubble-cane tests 8 tons of cane and 1,200 pounds of sugar less. However, Co. 281 gave consistently better yields of cane and indicated yields of sugar per acre than P.O.J. 36-M, P.O.J. 213, and P.O.J. 234, though its relative performance as compared with these varieties and with C.P. 807 was probably somewhat better than can be expected under weather conditions less favorable for its growth. Abnormally warm weather during the spring permitted it to germinate and begin to grow as early as any of the other varieties, in contrast to its usual late germination and comparatively slow growth under conditions ordinarily prevailing during the early spring months. This, combined with favorable ripening conditions during the fall, probably accounts for its relatively advanced stage of maturity, particularly during the latter part of the harvesting season, when its indicated yield of sugar per ton of cane closely approached and sometimes exceeded the yields from P.O.J. 234, which has heretofore consistently outyielded all varieties now grown commercially in pounds of sugar per ton of cane. Co. 281 has given the best results in tests carried on east of the Atchafalaya River, although very good results were obtained west of the river in Iberia Parish on Iberia silt loam soil, on which it was tested for the first time in 1932.

It has been shown that Co. 281 (*8*), like D-74, does not show the rapid deterioration characteristic of the P.O.J. varieties when windrowed. This property in itself renders the variety worthy of serious consideration, since possible freeze injury is one of the major hazards incidental to sugar production under Louisiana conditions. The growing of a sufficiently large acreage of a variety possessing satisfactory windrowing qualities introduces a safety factor of great economic importance. Co. 281 is comparatively brittle and probably subject to somewhat greater storm injury than any of the other commercial varieties. It is also susceptible to attack by the mosaic disease, and counts by pathologists during 1932 show a rapid increase

of the disease in this variety. To what extent this characteristic may limit its future usefulness remains to be ascertained.

During the last year Abbott (*1*) has demonstrated the existence in Louisiana of physiologic strains of the red-rot fungus, one of which, it was discovered, caused serious damage to Co. 281. Toward all other strains, particularly the dominant one generally attacking P.O.J. 213, this variety has proved extremely resistant, as shown by good stands of plant and ratoons throughout the district. However, should this newly discovered strain, found in the eastern district, be rapidly multiplying, eventual failure of stands such as have occurred in recent years with P.O.J. 213 might possibly result, especially since the naturally slow germination of Co. 281 would counteract any functional resistance shown by quick germination and establishment of plants characteristic of such varieties as C.P. 807 and P.O.J. 234. Therefore, while these findings cast some doubt on the permanent usefulness of Co. 281, nevertheless the pathologists believe they should not deter planters from increasing the variety and securing the immediate benefits that its many superior qualities will give. All growers, however, should be on the look-out for any signs of stand or stubble failure in order to substitute on the acreage other varieties in time to avoid economic loss such as has occurred with P.O.J. 213.

Co. 290 is the only variety so far tested that has exceeded C.P. 807 in yields of cane and sugar per acre. Indicated yields of sugar per ton of cane in comparative plant-cane tests of this variety in 1932 agreed very closely with those from C.P. 807, the average for all tests being practically identical for each variety, but it outyielded C.P. 807 in yield of cane per acre and therefore in yield of sugar per acre. The average for all tests was approximately 3½ tons of cane and nearly 700 pounds of sugar in favor of Co. 290. However, the average of all plant-cane tests in 1931 showed slightly lower yields of sugar per ton of cane and cane and sugar per acre from Co. 290 than from C.P. 807, and, as pointed out above, its comparatively better performance in 1932 probably resulted from weather conditions in that year being more favorable for its growth and ripening. Under the circumstances, the results in 1932 cannot be considered as indicating definite superiority of Co. 290. Stubble cane was not available for testing in 1931, but the results of a limited number of first-stubble tests in 1932 are very irregular and do not serve to indicate definite superiority of Co. 290 over C.P. 807, though the average results are slightly in favor of the former. The comparatively large diameter of the stalk of Co. 290, its easy stripping quality, and its low fiber content are important characteristics from field and factory standpoints, and its satisfactory performance, if maintained, should render it a very advantageous variety for commercial culture.

Co. 290, like Co. 281, is subject to attack by the mosaic disease, and in connection with the study of its performance the possibility of a serious cumulative effect of this disease should be borne in mind. Surveys in 1932 of such plantings as had been established showed a marked increase in the prevalence of the disease, infection amounting in some instances to as much as 25 percent. It is possible that the comparative absence of the disease in initial plantings may have been largely responsible for its having given such good results up to this time. The extent to which its susceptibility to mosaic may limit its value for commercial culture remains to be determined, but the absence

of adequate data concerning its stubbling qualities and of the extent to which it may prove to be injured as the result of the cumulative effect of the disease indicates that considerable risk would be involved in planting Co. 290 on more than a very limited acreage.

P.O.J. 234 is the only variety so far available for commercial culture that has consistently afforded cane of satisfactory quality for milling very early in the season. Aside from this favorable characteristic, it possesses no important desirable qualities. It has consistently proved a low-yielding variety and a very weak stubbler in tests carried on in previous years, but under the favorable weather conditions existing in 1932 it not only gave its usual high yields of indicated sugar per ton of cane but in all plant and first-stubble tests gave yields of cane per acre comparing favorably with those from P.O.J. 36-M and P.O.J. 213 and yields of sugar per acre comparing favorably with and frequently exceeding the yields from these varieties. The same was true in four of the five second-stubble tests. In the single third-stubble test it equaled P.O.J. 36-M in cane per acre and exceeded it in sugar per acre, but yielded less cane and sugar per acre than P.O.J. 213. Its unusually good performance as stubble cane undoubtedly resulted from the favorable conditions in 1932, and it appears entirely unlikely that equivalent results will ever be obtained under average weather conditions; but throughout the series of years during which it has been grown it has frequently given very satisfactory results as plant cane and occasionally as first stubble, especially when the preceding crop had been harvested at a comparatively late date; and in view of its early ripening characteristic and its relatively wide range of adaptability it is probable that it will continue to be grown on a limited acreage for early harvesting. However, the future usefulness of P.O.J. 234 may be greatly influenced by the satisfactory keeping quality of Co. 281 when it is windrowed and the resulting possibility of lessening the necessity for extremely early grinding through extending the grinding period later into the winter by protecting a portion of the crop from freeze damage by utilizing Co. 281 in this manner.

P.O.J. 213, P.O.J. 36-M, and P.O.J. 36, in view of their inferior qualities as compared with C.P. 807 and Co. 281, can no longer be regarded as canes of major commercial importance in Louisiana. The extreme susceptibility of P.O.J. 213 to red rot renders its cultivation a very hazardous venture which should never be attempted except under soil conditions ideal as to tilth and drainage. It has proved definitely unsuitable for culture on Sharkey clay and related types of poorly drained soils. Corroborating previous observations, results obtained with P.O.J. 36-M were, in almost all cases, less satisfactory than corresponding ones obtained with P.O.J. 213, but more satisfactory than results obtained with P.O.J. 36.

Two seedlings, C.P. 28/11 and C.P. 28/19, recently bred at the United States Sugar Plant Field Station located at Canal Point, Fla., have shown considerable promise. In limited tests they have given evidence of possessing the quality of early maturity, comparing favorably with that of P.O.J. 234, and have shown promise of superior vigor and better stubbling qualities. The results, however, are not sufficiently extensive to warrant definite conclusions at this time.

P.O.J. 2725, C.P. 71-B, C.P. 177, and C.P. 766 have consistently proved inferior to varieties now available for commercial cultivation.

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